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PLANETARY PHENOMENA FOR JULY AND ANGUST, 1915.

By Malcolm McNeill.

PHASES OF THE MOON, PACIFIC TIME.

Last Quarter..	July 3,	9^h 54^m P.M.	Last Quarter...	Aug. 2,	1^h 27^m P.M.
New Moon....	" 12,	1 31 A.M.	New Moon....	" 10,	2 52 P.M.
First Quarter.	" 19,	1 9 P.M.	First Quarter..	" 17,	6 17 P.M.
Full Moon....	" 26,	4 11 A.M.	Full Moon.....	" 24,	1 40 P.M.

The second and last eclipse of the year is a central eclipse of the Sun, occurring on August 10th. Like the eclipse of February, it will not be visible in America, the path of the center being wholly in the Pacific Ocean from a point between Japan and the Philippines to a point in the southern hemisphere south of Mexico; also on account of the more than average distance of the Moon from the Earth and its small apparent size it will, like the eclipse of February, be annular and not total, consequently of small scientific interest.

The Earth will be in aphelion on July 5th.

Mercury will be a morning star during the greater part of July and August. It passed inferior conjunction on June 26th and will come to superior conjunction on August 14th. Greatest west elongation will be reached on July 18th; it is then 20° 23′ west of the Sun and will rise 1^h 20^m before the Sun, and the interval will remain more than an hour until after August 1st. It will therefore be in fair position in the morning twilight for about three weeks. It will be in conjunction with *Venus* twice, the first time on July 10th, when both are too near the Sun for easy observation of the fainter planet, the second on August 4th, in the early morning. *Mercury* will then be 0° 18′, a little more than half the Moon's apparent diameter, north of *Venus*. At the same hour it will also be in conjunction with *Neptune*, 1° 21′ north of the latter. On July 22nd it passes 1° south of *Saturn*, both planets being below our horizon at the time of nearest approach, but they will not be far apart on the mornings before and after.

Venus is drawing near superior conjunction with the Sun, but remains a morning star. On July 1st it rises about $1^h 20^m$ before sunrise, but the interval diminishes to less than twenty minutes by the end of August. It will then be nearly at its maximum distance from the Earth, and consequently at nearly its minimum brightness, but it will still be bright enuf to be seen without a telescope until nearly the end of August. It will be in conjunction with *Saturn* on the morning of July 17th, passing 0° 38′ north; also with *Neptune* on the morning of August 4th, passing 1° 3′ north. The conjunctions with *Mercury* have already been mentioned.

Mars rises at about 2 A. M. on July 1st and at about 12:30 A. M. at the end of August. It moves about 45° eastward and 5° northward thru *Taurus* into *Gemini*. On July 1st it is about 5° south of the *Pleiades*. Just after the middle of the month it is rather near the first magnitude red star *Aldebaran*, passing about 5° north of the star on July 19th. By the end of August it will be about 10° south and west of *Castor* and *Pollux*, α and β *Geminorum*. During the two months its distance from the Earth will diminish about twenty-five millions of miles and its brightness will increase about twenty per cent. At the end of August it will be about twice as bright as it was when at its faintest in the autumn of 1914. That is, it will be about as bright as a normal first magnitude star.

Jupiter is nearing opposition with the Sun, rising about 11:30 P. M. on July 1st, and shortly after 7 P. M. on August 31st. It is in the constellation *Pisces*, a short distance west and south of the vernal equinox. Up to July 19th it moves about the Moon's apparent diameter eastward and northward. It then begins its westward or retrograde motion, reaching on August 6th a position about 10′ south of its place on July 1st. During the rest of the month it moves about 2° in the same direction, reaching a point about 20′ south of its position in early June.

Saturn passed conjunction with the Sun on June 28th and became a morning star. Its distance from the Sun increases rapidly, so that it reaches a position fit for naked-eye observation in the morning twilight by the middle of July. By August 1st it rises before 3 A. M., and at the end of that month at about 1 A. M. It is moving eastward, about 8° in the constellation *Gemini*, about 10° west and south of *Castor* and *Pollux*. Its conjunction with *Venus* on July 17th and with *Mercury* on July 22nd have been mentioned. By the end of August it is about 6° east of *Mars*.

Uranus is in fair position for observation as it comes to opposition with the Sun on August 6th. It is in the constellation *Capricorn* and moves about 2° westward and southward during the two months. No bright star is near, but in early July it is about 2° west of the fourth-magnitude star *ι Capricorni*, and the subsequent motion of the planet carries it away from the star. By the end of August it will be only a few minutes east and south of another fourth-magnitude star, *θ Capricorni*. It will be occulted by the Moon on the night of July 26-27th, visible in the United States, and again on August 23rd, not visible in this country.

Neptune is in conjunction with the Sun on July 23rd. Its conjunctions with *Mercury* and *Venus* on August 4th have been mentioned.

NOTE.

The next number of these Publications will be issued in the latter part of August, instead of on August 10th, to permit the inclusion of an account of the proceedings of the August meeting of the American Astronomical Society.

Publication Committee.